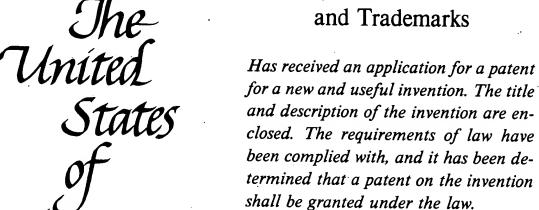
# ARTIFACT SHEET

artifact	tifact number below. Artifact number is application number + type code (see list below) + sequential letter (A, B, C). The first
artifact	folder for an artifact type receives the letter A, the second B, etc es: 59123456PA, 59123456PB, 59123456ZA, 59123456ZB
Indicate individual	e quantity of a single type of artifact received but not scanned. Create and artifact folder/box and artifact number for each Artifact Type.
	CD(s) containing:  computer program listing  Doc Code: Computer  pages of specification  and/or sequence listing  and/or table  Doc Code: Artifact  Content unspecified or combined  Doc Code: Artifact  Artifact Type Code: U  Artifact Type Code: U
	Stapled Set(s) Color Documents or B/W Photographs Doc Code: Artifact Type Code: C
	Microfilm(s) Doc Code: Artifact Artifact Type Code: F
	Video tape(s)  Doc Code: Artifact Artifact Type Code: V
	Model(s)  Doc Code: Artifact Artifact Type Code: M
X	Bound Document(s)  Doc Code: Artifact
	Confidential Information Disclosure Statement or Other Documents marked Proprietary, Trade Secrets, Subject to Protective Order, Material Submitted under MPEP 724.02, etc.  Doc Code: Artifact Type Code X
	Other, description:  Doc Code: Artifact Type Code: Z

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# United States Patent

The Commissioner of Patents

Grants to the person or persons having title to this patent the right to exclude others from making, using or selling the invention throughout the United States of America for the term of seventeen years from the date of this patent, subject to the payment of maintenance fees as provided by law.

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#### US005292209A

# United States Patent [19]

Calandra, Jr. et al.

[11] Patent Number:

5,292,209

[45] Date of Patent:

Mar. 8, 1994

[34]	BEARING	PLATE
[75]	In.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	D

[75] Inventors: Frank Calandra, Jr., Pittsburgh; John C. Stankus, Canonsburg; Eugene H. Stewart, Pittsburgh, all of Pa.

[73] Assignee: Jennmar Corporation, Pittsburgh, Pa.

[21] Appl. No.: 61,841

[22] Filed: May 14, 1993

## [56] References Cited

#### U.S. PATENT DOCUMENTS

U.S. PATENT DOCUMENTS						
2,192,554	3/1940	Misseeff-Muspratt .				
2,398,130	4/1946					
<b>~</b> →2,667,037	1/1954	Thomas et al 405/288				
~2,748,594	6/1956	Edwards .				
	10/1958					
3,022,100	2/1962					
-3,023,862	3/1962	Launay .				
3,076,672	2/1963	Heintzmann et al				
3,090,203	5/1963	Durget*.				
3,126,708	3/1964	Jasper .				
3,168,815	2/1965	Blenkle et al.				
3,226,934	1/1966	Emery				
	3/1966					
	8/1968	Seifert et al				
		Deloffre .				
3,413,012 1	2/1968	Fox .				
3,415,064 1		Talobre 405/302.1				
3,478,523 1	1/1969	Reusser et al				
	7/1977	Hannan .				
	2/1981	White 405/259				
	3/1984	Constapel 405/151				
4,507,020	3/1985	Zeitler et al 411/531				
<b>4,634,318</b>	1/1987	Koumal 405/259				
<del>4,708,559</del> 1	1/1987	Locotos 411/545				

## FOREIGN PATENT DOCUMENTS

3820700 12/1989	Fed. Rep. of Germany
3919277 8/1990	Fed. Rep. of Germany
<del>-11</del> 10046 10/1955	France
J-222640 171060	

1304298 8/1962 France . 1072893 6/1967 United Kingdom .

### OTHER PUBLICATIONS

"Keeping the Roof Over Your Head", Keystone Bolt Company, 1979.

"J-Channel Beams For Mine Roof Support", Coal Age, Apr. 1987.

"Jennmar Mine Roof Problem-Solving Systems", Jennmar Corporation.

"Jennmar-J-Channel Beams", Jennmar Corp., Jul. 1986.

Primary Examiner—Dennis L. Taylor Attorney, Agent, or Firm—Stanley J. Price, Jr.

#### 7] ABSTRACT

An elongated channel member for supporting the surface of an underground rock formation includes a base portion with a bearing surface for contacting the rock strata and an opposite surface having a longitudinally extending central rib and flanged edges for resisting deflection and bending of the channel member under the load of the rock strata. A plurality of openings spaced a preselected distance apart extend through the central rib. A bearing plate is positioned in overlying abutting relation with each opening in the channel member. The bearing plate includes embossed areas and longitudinally flanged edges that are complementary in shape with the central rib and flanges on the channel to securely engage the bearing plate on the channel member. Thus, the bearing plate engages the channel member to restrain longitudinal and lateral movement of the bearing plate on the channel member and stiffen the channel member to resist bending. An anchor bolt extends through the aligned openings in the bearing plate and channel member into a bore hole drilled in the rock formation. Anchoring the bolt in the bore hole compresses the bearing plate against the channel member to urge the channel member into compressive relation with the surface of the rock formation to support the rock formation.

20 Claims, 3 Drawing Sheets

